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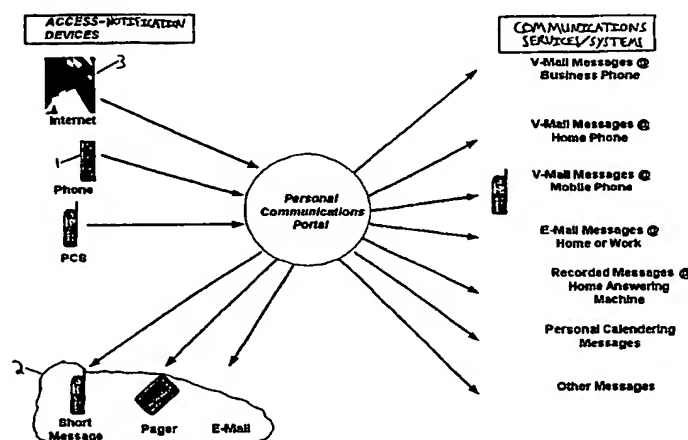
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(54) Title: UNIFIED MESSAGING SYSTEM



(57) Abstract

The present invention relates to coordinating, accessing, retrieving, and managing messages from multiple, independent multimedia communications services/systems – e.g., voice mail, facsimile, e-mail, online automated information, pagers, beepers, wireless devices, hand-held devices, stand-alone answering machines, and the like – from a single point of access. Such services/systems can be associated with home, work or mobile phones, computer or Internet, personal accounts, or online public information. Telephone services can include voice mail, fax mail, or answering machines attached to wired or wireless phones. Computer or Internet services can include e-mail, Web sites, or information/content services. The invention also supports access to personal account information – e.g., bank by phone, credit card balances, and the like – as well as access to online public information – e.g., stocks, news, sports, weather, and the like. The invention provides access to such services/systems from a single point of access, wherein a user connects to the single point of access via a conventional telephone, a wireless device, or an Internet Access Device. The notification of new incoming messages is integrated through a single (or multiple) access-notification device(s), such as a pager, beeper, e-mail, or short message over a mobile telephone.

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UNIFIED MESSAGING SYSTEM

Field Of The Invention

The present invention relates to a unified messaging system which integrates a plurality of communications services/systems. More particularly, the invention enables a user to access, retrieve, and manage non-real time communications--e.g., e-mail, voice mail, facsimiles, voice messages on stand-alone answering machines, and the like--from a plurality of independent communications services/systems by logging on to a single access point with a unified-user-id and a unified-password. Further, the invention is also configured to forward notification events to a user from a plurality of independent communications services/systems, such as pagers, automated calendars/schedulers, electronic agents, and the like.

Background Of The Invention

Modern technology has eliminated the need for face-to-face communications by providing people with numerous alternative communications services/systems. For example, people may establish a real-time, two-way communication with each other by employing a conventional telephone, a wireless (mobile) telephone, an Internet telephony application, a video application, a chat application, and the like. Alternatively, people may establish non-real-time communications with each other by exchanging electronic messages via non-real time communications services/systems--e.g., e-mail, voice mail, facsimile, and the like.

The downside to the explosive growth of communications technologies is that users can no longer manage each service/system in isolation and still achieve the levels of service they require. Communications services/systems have become, in effect, complex distributed systems. Thus, users are looking for ways to integrate, or unify, communications systems/services as a means to reduce complexity and fully utilize their potential.

Although new services/systems are constantly developed to facilitate communication among users, the result is often not user-friendly . More and more,

what is intended to make life simple only intensifies its complexity. Namely, advances in telecommunications have created an explosion in the variety of unique user appliances that are designed to let users exploit these services. These devices are needed to derive the value, but often, their uniqueness adds unwanted complexity. Getting full value from the array of communications services/systems and their complementary instrumentality may only occur when users can integrate, or unify, these new communications technologies.

No place can the need for unified communications be seen more than in the area of non-real-time communications. People make every effort to communicate with each other in real-time in an effort to reduce the travel time associated with face-to-face communications; this can be seen in the explosive growth of wireless services being used for anytime-anywhere communications. In order to conduct a real-time communication, however, both parties must be available at the same time. Since such simultaneous communications are often not possible, people have learned to communicate with each other in non-real time (as discussed above). Thus, non-real-time communications services/systems are rapidly expanding. Moreover, the types of devices designed to work with these services/systems—e.g., facsimile machines, pagers, wired or wireless Internet Access Devices (hereinafter "IADs"), and the like—are ever expanding.

Growth in these types of non-real time communications has been and will continue to be phenomenal. This can be seen in the non-real-time communications growth that comes from two types of media, specifically, wireless voice mail and e-mail. Stating the obvious, the growth in wireless voice mail is a function of the growth in wireless customers. As one grows so does the other. The Yankee Group, in a recent study, projected that there will be 60 million new wireless customers in the United States over the next five years. The 1998's global wireless population exceeded 300 million, with 80 percent of the growth taking place outside the United States.

E-mail growth has been even more phenomenal. Here too, a growth correlation evidences itself—i.e., the growth in Internet users spawns growth in e-mail use. With 75 million new Internet customers projected in the United States over the next five years, and 300 million users worldwide by the year 2001, e-mail will be mainstream

among consumers.

Because of the proliferation of communications and information services/systems, it has become extremely difficult and often inefficient for users to memorize and manage access to these services/systems. For example, a typical user may rely on a home telephone with a messaging mechanism (e.g., a stand-alone answering machine), a business telephone with another messaging mechanism (e.g., a voice mail service), a wireless mobile phone with yet another messaging mechanism, a facsimile machine, an e-mail account at home, another e-mail account at work, and an array of automated services and/or electronic agents—e.g., banking services, news services, stock tickers, automated calendars/schedulers, and the like. Each of the above services/systems has different methods for accessing, retrieving, and managing messages; some use the telephone while others use the Internet, with a growing number of Wireless Access Protocol (hereinafter "WAP") devices that offer convergence services. Moreover, in order to access these services/systems, a user must keep track of multiple telephone numbers, URLs, e-mail addresses, account numbers, user-ids, and passwords.

Therefore, there is a need for a method and system which will facilitate the accessing, retrieval, and managing of all message types from all communications services/systems while providing quick response times, delivery, and notification alerts.

Summary Of Invention

The present invention teaches a unified messaging system which enables a user to coordinate, access, retrieve, and manage non-real time communications—e.g., e-mail, voice mail, facsimiles, voice messages on stand-alone answering machines, beeper-messages, pager-messages, and the like—from a plurality of independent communications services/systems (regardless of the technology) by logging on to a single access point with a unified-user-id and/or a unified-password.

In another embodiment, the invention is configured to automatically forward notification alerts—e.g., beeper-messages, pager-messages, ticklers, and the like—to a user from a plurality of independent communications services/systems—e.g., beepers, pagers, automated calendars/schedulers, e-mail, and the like—according to criteria that

is specified by the user.

Brief Description Of The Drawings

Figure 1 is a diagram illustrating the multitude of communications services/systems, access-notification devices, access methods, and notification methods that are supported by one embodiment of the invention.

Figure 2 is a diagram illustrating the various communications interfaces that are supported by one embodiment of the invention.

Figure 3 is a diagram illustrating the various system components of one embodiment of the invention.

Figure 4 is a diagram illustrating the various elements of a Personal Communications Database of one embodiment of the invention.

Figure 5 is a diagram illustrating the various functions of the Administration Module of one embodiment of the invention.

Figure 6 is a diagram illustrating the various features provided over the Internet for a user in one embodiment of the inventive system.

Figure 7 is a diagram illustrating the various features provided over the telephone for a user in one embodiment of the inventive system.

Figure 8 is a diagram illustrating the various features provided over the WAP enabled PCS/Mobile phone for a user in one embodiment of the inventive system.

Figure 9 is a diagram illustrating the various input and output interfaces supported by the Communications Gateway Server in one embodiment of the invention.

Detailed Description Of The Invention

To provide an overall understanding of the inventive system, certain illustrative embodiments will now be described. However, it will be understood by one of ordinary skill in the art that the services/systems described herein can be adapted and modified to provide services/systems for other suitable applications and that other additions and modifications can be made to the invention without departing from the scope of the inventive concept.

The invention relates to systems and methods for coordinating access to and notification from various personal communications services/systems. The proposed access to the majority of such services/systems is provided over a conventional telephone, a wireless device, an Internet Access Device (hereinafter "IAD"), or other communications device in a single communications session regardless of the provider of the underlying communications services/systems. Such services/systems include, but are not limited to: telephone services such as voice/facsimile mail, stand-alone answering machines; automated on-line information services such as bank-by-phone, account balance, city/restaurant/movie guides; Internet services, such as electronic mail; and Web services, such as favorite Web pages, personal calendars/reminders, and address books. Additionally, the system supports notification alerts of certain events originating from the various communications services/systems to one or more access-notification devices, such as a pager, electronic mail, or a short message on a PCS/Mobile phone.

The present system can be implemented using a conventional computer system with an operating system that supports PSTN, wireless telephony, IP voice/data communications, Internet User Interfaces, and database storage systems. The computer system can be programmed with the underlying inventive system to provide users with the kind of services intended by this invention. The computer system can work as a stand-alone system or as part of a networked computer system under client/server architecture. The computer system can be implemented as an enterprise solution behind a corporate firewall or as a service provider solution for mass-market deployment. Alternatively, the computer system can comprise dedicated devices (e.g.,

embedded systems) that can be incorporated into existing hardware devices (e.g., telephone systems, mobile switch systems, PBX systems, etc.) and serve as an adjunct processor in a telephone AIN. Accordingly, it will be understood by one of ordinary skill in the art that the systems and methods described herein have wide applicability and can be incorporated in many systems and realized in many forms, all without departing from the scope of the inventive concept.

The systems and methods described herein provide a user with a unified messaging and notification solution that provides a single access point (hereinafter "SAP") for a plurality of communications services/systems regardless of the media types, number of different service providers, protocols, mediums, or the devices used to access such communication services/systems. In this illustrative embodiment, the SAP is a personal communications portal (hereinafter "PCP"), such as a Web portal. Using an "access-notification device," a user can log-on to the PCP (from virtually anywhere and at virtually any time) to coordinate, access, retrieve, and manage a plurality of messages from the plurality of communications services/systems. As illustrated by Figure 1, the array of possible access-notification devices includes, but is not limited to: a conventional telephone 1; a wireless device 2 (e.g., a cellular phone, a mobile phone, a palm pilot, a pager, etc.); and an IAD 3, such as a personal computer, a workstation, a palm pilot, and the like, connected to the PCP via an Internet connection (e.g., a modem, a T1 line, an ISDN connection, a satellite link, etc.) and according to a specific protocol (e.g., TCP/IP, WAP, etc.). The plurality of communications services/systems includes, but is not limited to: e-mail accounts; voice-mail accounts; facsimile machines; pagers and paging services; beepers and beeping services; personal stand-alone services/systems (e.g., a stand-alone answering machine); personal communications services/systems over mobile phones (hereinafter "PCS/Mobile"); short message services over mobile phones (hereinafter "SMS/Mobile"); online news groups; online services and sources of information and Web sites (e.g., banking, stock brokers, trade organizations, etc.); Internet phones and Internet telephony; video services; and electronic agents, such as automated calendars/schedulers that forward alerts, or so-called "ticklers," to a user to notify the user of an upcoming appointment.

As mentioned above, in addition to providing a unified messaging system, the

invention also provides a user with a unified notification system for a plurality of communications services/systems regardless of the media types, number of different service providers, protocols, mediums, or the devices used to access such communication services/systems. In this mode of operation, the invention forwards outgoing notification alerts to a user (via an access-notification device) according to notification criteria that is entered and/or selected by the user. For example, a user can specify that a notification be instantly forwarded from the PCP to a specific access-notification device upon the receipt of specific message types (e.g., pager messages, beeper messages, e-mail messages, ticklers, and the like) that are received from specific communications services/systems (as discussed above). Although there is a wide array of access-notification devices, in the illustrative embodiment, the access-notification devices that are most often used are wireless devices, especially pagers, beepers, palm pilots, and mobile phones.

Figure 2 illustrates the various communications interfaces that are supported by an illustrative embodiment of the present invention. A Communications Gateway Server (hereinafter "CGS") translates media protocols and information from the access-notification devices (as discussed above) and from the plurality of communications services/systems (as discussed above) so that they conform with the operating system and network protocols of the SAP. The CGS also translates media protocols and information from the PCP so that they conform to the operating system and protocols of the access-notification devices (as discussed above).

Now referring to Figure 3, various components are depicted for an illustrative embodiment of the invention. Database Server 31 stores communication services profiles for each user of the SAP. Administration Module 32 performs all the registration, subscriber service administration, and maintenance processes related to the Database Server. Notification gateway Server 33 receives incoming notification events from various communications services/systems and provides outgoing notification alerts according to the notification criteria (as discussed above) established by a user. Internet User Interface 34 allows a user to access the PCP with an IAD. Telephone User Interface 35 also allows a user to access the PCP with an IAD. Wireless User Interface 36 allows the user to access the PCP service over a wireless

PCS/Mobile device capable of supporting WAP. CGS 37 translates inputs received from the Internet User Interface (or from the Telephone User Interface) so that they are compatible with the various communications services/systems and vice versa. The Operations-Administration-Maintenance module (hereinafter "OA&M") 38 supports system level administration, configuration, operations, monitoring functions, and routine maintenance of the PCP service.

Now referring to Figure 4, the Database Server is depicted in more detail. The Database Server includes multiple Personal Communications Databases (hereinafter "PCDs") 41 corresponding to each user of the unified messaging and notification system. Each of the PCDs includes a User Profile 42, at least one Communications Profile 43, a Personal Address Book 44, a Personal Calendar 45, one or more Notification Events 46, one or more Notification Schedules 47, and Billing Data 48. The User Profile of a PCD includes a "unified-user-id" and a "unified-password" that will uniquely identify the user associated with that PCD; the User Profile also includes other relevant information about the user such as payment methods, addresses, and the like.

The Communications Profile includes information about each communications service/system that a user wishes to access via the PCP; the information in the Communications Profile may be easily changed by the user to reflect the current communications services/systems that the user wishes to unify. This information may include: identifiers to identify and reference a plurality of communications services/systems (for administration and/or access); one or more service types (e.g., voice/fax, e-mail, IVR, Web, etc.); names, account-ids, and passwords for one or more service providers and/or systems; one or more methods to access the communications services/systems (e.g., telephone numbers, access setup scripts, server names, URLs, e-mail addresses, etc.); and filters and preferences to control access and order of access to the PCP by the communications services/systems. The user enters an access setup script (i.e., the information needed to establish the connection to a specific communications service/system) as if the user were to connect to the specific communications service/system independently. Along with the access setup script, the user may also provide the incoming notification type for notification messages that can be received from the various communications services/systems.

The Personal Address Book includes all contact information, including names, telephone numbers, addresses, and the like, created by the user so that they are accessible over the SAP. The Personal Calendar includes all appointments, reminders, and schedules including dates, times, durations, and activities created by the user over the Internet, so that it is accessible over the PCP using an access-notification device (as discussed above).

The Incoming Notification Events 46 include all pager, beeper, tickler, and e-mail notifications received from various communications services/systems. The Outgoing Notification Schedule(s) 47 defines what access-notification device to use at various days and time ranges in order to alert users of new incoming notification events.

The Billing Data 48 stores the detailed usage information for each of the activities performed by the user over the PCP devices.

The Administration Module, as depicted by Figure 5, processes inputs from the Internet User Interface or from the Telephone User Interface or from the Notifications Gateway Server, and it retrieves or stores information in the Personal Communications Database on the Database Server. The Administration Module performs the following processes:

- Registration Process 51 to let new users sign up from the Internet User Interface;
- Payment Process 52 to allow the Internet User Interface to accept credit card payment during sign-up or upgrade of the service, or to allow the Telephone User Interface to extend the service usage automatically;
- Maintain User Profiles 53 processes requests originating from either user interface;
- Maintain Communications Profile 54 processes requests originating from either user interface;
- Maintain Personal Address Book 55 processes requests originating from either user interface;
- Maintain Personal Calendar 56 processes requests originating from either user interface or the notification gateway server;
- Maintain Notifications Events 57 processes requests originating from the Notifications Gateway Server;

- Maintain Notifications Schedule 58 processes requests originating from either the telephone or internet user interface;
- Access Notifications Schedule 59 interacts with the Notifications Gateway Server;
- Maintain Billing Data 510 processes requests originating from either user interface or the notification gateway server.

As depicted by Figure 6, for this illustrative embodiment, the Internet User Interface is a Web page with online forms having text fields. As is familiar to those skilled in the art, the Internet User Interface can be created with markup languages (e.g., HTML, XML, etc.). The Internet User Interface allows the user to access the PCP over any Internet connection using a standard Web browser (e.g., MS Internet Explorer, Netscape Navigator, etc.) or using a micro-browser running on a handheld IAD (e.g., a palm pilot). Thus, a user can employ a browser to access the PCP and enter information into the text fields of the online forms so as to coordinate, access, monitor, and manage her personal profile. The Internet User Interface supports the following user functions:

- General Information 61— allows the user in various HTML forms to access general information about the PCP service such as service description, help screens, pricing policies, legal agreements, and frequently asked questions;
- User Registration 62 – allows the user to sign-up for the PCP service. To gain access to the PCP service, the user must select a unique unified user-id, unified password, and unified e-mail address. Upon submission of the information asked in the user registration form, the administration module will complete the registration process by creating a personal communications database record in the database server. For services that require payments, the user must also provide the credit card information, which will be processed by the administration module using the payment process to verify and authorize the credit card; and
- Log-in 63— A registered user may log-in to the PCP service over the Internet connection by providing a valid unified-user-id and unified-password to perform administration and service access functions;
- Setup Communication Profile 64 – A registered user may setup multiple

communications profiles corresponding to multiple communications services/systems (as discussed above) to be accessed over the PCP using access-access-notification devices (as discussed above);

- Setup Personal Address Book 65 – a registered user may setup information for multiple contacts, such as names, telephone numbers, addresses, and the like, in a personal address book, which can be accessed over the PCP at any time from an access-access-notification device.
- Setup Personal Calendar 66 – a registered user may setup information for multiple events such as date/time, location, description, reminder schedule, etc. in a personal calendar, which can be accessed over any PCP at any time from an access-access-notification device.
- Setup Notification Schedules 67 – a registered user may setup multiple types of outgoing notification schedules that would allow notification on selected days and times over a access-notification device. The notification gateway server will use these schedules to initiate outgoing notifications to the user device.
- Access Communications services/systems 68 – a registered user may access, through an Internet connection, any of the pre-defined communications services/systems using the parameters stored in the communications profile belonging to the personal communications database of the user. The communication can be of any type such as voice mail, facsimile mail, answering machine, e-mail, Web page, bank by phone, or any other telephone or Internet service, including dialing any telephone number stored in the personal address book, over the current Internet connection. The Internet User Interface displays a list of communications services/systems on the user's browser. The user can select communications services, one at a time, to connect to any number of services.

The Telephone User Interface, as depicted by Figure 7, allows a user to access the PCP service over any telephone connection using a conventional telephone which allows voice or touch tone input. As is generally known to those skilled in telephony, a user can listen (through the speaker of a telephone), use voice commands (by speaking into the microphone of a telephone), and/or enter data (by pressing the buttons on the touch-tone keypad of a telephone) in order to communicate with the unified system.

The Telephone User Interface supports the following user functions:

- General Information 71– allows a user to access general information about the PCP service such as service description, help information, pricing policies, legal agreements, and frequently asked questions in various voice menus;

- Log-in 72— a registered user may log-in to the PCP service over a telephone connection by entering a valid unified-user-id and unified-password when prompted by a voice menu on the touch tone key pad. Once logged-in, the user can perform administration and service access functions;
- Change Notification Schedules 73 — a registered user may change any pre-defined notification schedule, or type of access-notification device to be used for outgoing notifications by entering the notification schedules via the telephone keypad.
- Access Communications services/systems 75 — a registered user may access any of the pre-defined communications services/systems using the parameters stored in the communications profile belonging to the personal communications database of the user, through the telephone connection. The communication can be of any type such as voice mail, facsimile mail, answering machine, e-mail, Web page, bank by phone or any other telephone or Internet service including dialing any telephone number stored in the personal address book, over the current Internet connection.

The Wireless User Interface, as depicted by Figure 8, allows a user to access the personal communication portal service over any PCS/Mobile device capable of supporting WAP. As is familiar to those skilled in the art, information can be displayed on the micro-browser of a small display area associated with a PCS/Mobile device or other handheld wireless device, whereby a user can browse through and navigate text menus. The PCS/Mobile device also has the capability of connecting calls directly from the WAP interface. The Wireless User Interface supports the following user functions:

- Auto Log-in 81— a registered PCS/Mobile user may press a special button on the PCS/Mobile handset to get connected to the PCP service. The wireless user gets automatically authenticated with the WAP server as a valid user based on the wireless device identification. The WAP Server behaves as a gateway between the PCS/Mobile device and the communications gateway server. Once logged-in, the user can perform the following service access functions:
- Access Communications services/systems 83— a registered user may access any of the pre-defined communications services/systems using the parameters stored in the communications profile belonging to the personal communications database of the user, through the PCS/Mobile WAP session. The communication can be of any type such as voice mail, facsimile mail, answering machine, e-mail, Web page, bank by phone, or any other telephone or Internet service including dialing any telephone number stored in the

personal address book, over the current Internet connection through the WAP Server. The Wireless User Interface displays a list of communications services/systems on the PCS/Mobile handset micro-browser. The user can select any communications service, one at a time from the micro-browser, to connect to any number of services.

The Communications Gateway Server, as depicted by Figure 9, is the core of the invention; it performs all the protocol translations to connect a user to the required communication services/systems and meet the user device requirements. The Communications Gateway Server is capable of interfacing with any type of communications network such as the Internet or telephone as input/output media. There are six main scenarios that the Communications Gateway Server supports:

- (1) The user uses a telephone device such as home or work phone or pay phone or mobile phone using the Telephone User Interface 91 to access telephone communications services/systems 94;
- (2) The user uses a telephone device, such as home or work phone or pay phone or mobile phone, using the Telephone User Interface 91 to access Internet communications services/systems 95 ;
- (3) The user uses an Internet device, such as a PC, kiosk or WebTV, using the Internet User Interface 92 to access telephone communications services/systems 94;
- (4) The user uses an Internet device, such as a PC, kiosk or WebTV, using the Internet User Interface 92 to access Internet communications services/systems 95;
- (5) The user uses a PCS/Mobile device supporting the Wireless User Interface 93 to access telephone communications services/systems 94; and
- (6) The user uses a PCS/Mobile device supporting the Wireless User Interface 93 to access Internet communications services/systems 95;

The various modules embedded in the Communications Gateway Server support the above user scenarios. For example, the IVR Server supports the Telephony User Interface, the Internet Server supports the Internet User Interface, the WAP server supports the Wireless User Interface, the PSTN Services Modules support the connections to the telephony communications services/systems, and the IP Services

Modules 105 support the connections to the Internet communications services/systems.

In scenario (1) , the Communications Gateway Server will initiate the call setup script for the specific communications service stored in the personal communications database, and bridge (conference) the user telephone session (call) to the out-dialed communications services. The call setup script, for example, may consist of out-dialing the telephone number, waiting for an answer, automatically out-pulsing the account number and password from the communication services profile, and connecting to the user. During the time it takes for the Communications Gateway Server to establish a session with the communications services, the Telephone User Interface may provide any type of content messages to a user such as audio advertisements, announcements, and the like. Once the session is established, the user is allowed to interact with the communications services just as if the communications services were initiated directly from the user's telephone. The Communications Gateway Server monitors the activity and specifically looks for a special combination of buttons pressed by the user (e.g., "****") to terminate the session with the current communications services. When this occurs, the Communications Gateway Server returns the call control to the Telephone User Interface to process the next request from the user. The information retrieved with this type of interface can be any voice mail, automated voice response, answering machine messages, or account balances. The user can also perform live telephone communication, if desired. The user may also download a facsimile message if the user device is capable of receiving faxes.

In scenario (2) , the Communications Gateway Server will connect to the selected communication service over the IP network using the communication services profile stored in the personal database. The Communications Gateway Server will extract the information from the IP based communication service, translate it and replay it to the user over the telephone device. This information can be a list of e-mail, Web pages, or any other IP based information content.

If the communications services/systems are associated with a POP3/IMAP4 mail account, then the Communications Gateway Server will retrieve the communication service profile from the personal database information stored on the database server

and connect to the appropriate POP3/IMAP4 mail server. The Communications Gateway Server will first retrieve the total message count and playback the count as a voice message to the user over the telephone. Then the Communications Gateway Server will retrieve each message header individually, and play the header information as a voice message by converting the text in the header to voice using standard text to speech conversion utilities. While listening to the header, at any time, the user can press a special button (e.g., "1") to instruct the system to playback the entire message. Upon receiving this information, the Communications Gateway Server will retrieve the message body from the POP3/IMAP4 mail server. The message body may consist of several body parts besides the header. These body parts could be of type text, html, voice, or facsimile. If the body part is of type text, the Communications Gateway Server will convert the message content to a voice message using the text to speech conversion utilities, and play it to the user over the telephone device. If the message is of type voice, it will be played as a voice message to the user over the telephone. Depending on the format of the voice message, it may or may not be necessary for the Communications Gateway Server to convert the message format. If the message is of type facsimile, the user will be given an option to download the facsimile on the current telephone session or route the facsimile to a different facsimile telephone number. If the user chooses to download the facsimile on the current telephone session, the facsimile will be converted to G3/G4 facsimile format and downloaded to the facsimile machine associated with the telephone device. If the user chooses to route the facsimile to a different facsimile telephone number, the system will initiate a separate session with the remote facsimile telephone number and download the facsimile message using the G3/G4 protocols.

If the communications services/systems are associated with a Web page, the text content of the Web pages will be converted to voice message using the standard text to speech conversion utilities by the Communications Gateway Server and played back as voice message to the user over the telephone device.

In scenario (3), the Internet User Interface will display a simulated touch-tone keypad on a user's browser screen, similar to the touch-tone keypad on any telephone. The user can connect to the selected communications services/systems via the

Communications Gateway Server. The Communications Gateway Server will initiate the call setup script for the specific communications services/systems stored in the personal database, and bridge (conference) the user Internet session to the out-dialed communication service using standard IP telephony protocols. As is generally known to one of skill in Internet networks, IP telephony allows a client browser that supports H.323 telephony standards to communicate to any telephone network through a gateway service, such as the Communications Gateway Server discussed in this patent. The call setup script may consist of out-dialing the telephone number, waiting for an answer, automatically out-pulsing the account number and password from the communications services/systems profile, and connecting to the end user. During the time it takes for the Communications Gateway Server to establish a session with the communications services/systems, the Internet User Interface may provide any type of content messages to a user, such as display advertisements, audio advertisements, or other announcements. The system provides the audio output from the communications services/systems to the user over the audio speakers associated with the IAD. The user can interact with the communications services/systems either by using the simulated touch tone keypad on the Internet browser screen, or by speaking into the microphone attached to the IAD. As is generally known to one of skill in computer systems and networks, any IAD using an HTML browser interface can be adapted with audio devices that can receive and send audio signals, such as those generated by a human. The information retrieved with this type of interface can be any voice mail, automated voice response, answering machine messages, or account balances. The user can also perform live telephone communication, if desired. If the information to be downloaded is a facsimile message, then the Communications Gateway Server will translate the facsimile message into a suitable file format (e.g., the TIFF file format). The TIFF file will be displayed as a graphical image at the end user's browser screen using the IAD's capabilities to process such file formats.

In scenario (4), the Communications Gateway Server will connect the user to the selected communications services/systems over the IP network using the communications services/systems profile stored in the personal database, and it will bring the information directly to the end user's browser. This information can be a list of

e-mail, Web pages, or any other IP based information/content. If the communications services/systems are associated with a POP3/IMAP4 mail account, then the Communications Gateway Server will retrieve the communications services/systems profile from the personal database information stored on the database server and connect to the appropriate mail server. The Communications Gateway Server will retrieve the message headers and the list of message headers will be displayed at the user's browser. The user can click on any of the displayed message headers on the screen to retrieve the corresponding message from the POP3/IMAP4 server through the Communications Gateway Server. Upon receiving this information, the Communications Gateway Server will retrieve the message body from the POP3/IMAP4 mail server. The message body may consist of several body parts besides the header. These body parts could be of type text, html, graphical image, voice, or facsimile supported by MIME format, or by other formats. As is generally known to one of skill in the art, the body part can be displayed on the screen using the appropriate viewers available as standard components, or plug-in components, on a computer system. If the body part is of type text, html, graphics image, or facsimile, it will be displayed on the user's browser using the appropriate viewers residing on the user's computer. If the body part is of type voice encoded in ".wav" format, it will be played back on the user's audio speakers, which are connected the computer. Depending on the format of the voice message stored in the e-mail message, it may or may not be necessary for the Communications Gateway Server to convert the message format. Optionally, the user may choose to route the e-mail contents to a facsimile machine by providing a facsimile telephone number. In this case, the Communications Gateway Server will convert each body part to a facsimile file that can be downloaded to a G3/G4 compatible facsimile machine and establish a facsimile session with the destination facsimile machine. If the communications services/systems are associated with a Web page, a user's browser is directly linked to the appropriate URL.

In scenario (5), a user can select a telephone service from the micro-browser capability provided by the Wireless User Interface. The user can connect to the selected communications services/systems via the Communications Gateway Server. The Communications Gateway Server will initiate the call setup script for the specific

communications services/systems stored in the personal database, and bridge (conference) the user PCS/Mobile phone device to the out-dialed communications services/systems using standard mobile telephony protocols. The call setup script may consist of out-dialing the telephone number, waiting for an answer, automatically out-pulsing the account number and password from the communications services/systems profile, and connecting to the user. To accomplish telephony connection from the wireless device, the data connection previously established by the micro-browser will be terminated. Once the user is connected to the appropriate communications services/systems, the user can interact with the communications services/systems by either using the touch tone keypad, or by speaking into mouthpiece on the PCS/Mobile handset.

In scenario (6), the Communications Gateway Server will connect the user to the selected communications services/systems over the IP network using the communications services/systems profile stored in the personal database, and it will bring the information directly to the user's micro-browser using the data connection. This information can be a list of e-mail, Web pages, or any other IP based information/content. If the communications services/systems are associated with a POP3/IMAP4 mail account, then the Communications Gateway Server will retrieve the communications services/systems profile from the personal database information stored on the database server, and connect to the appropriate mail server. The Communications Gateway Server will retrieve the message headers, and the list of message headers will be displayed at the user's browser screen. The user can click on any of the displayed message headers on the screen to retrieve the corresponding message from the POP3/IMAP4 server through the Communications Gateway Server. Upon receiving this information, the Communications Gateway Server will retrieve the message body from the POP3/IMAP4 mail server. The message body may consist of several body parts besides the header. These body parts could be of type text, html, graphical image, voice, or facsimile supported by MIME, or by other formats. If the body part is of type text or html, it will be displayed on the user's micro-browser using the appropriate viewers residing on the user's computer. Optionally, the user may choose to route the e-mail contents to a facsimile machine by providing a facsimile telephone

number. In this case, the Communications Gateway Server will convert each body part to a facsimile file that can be downloaded to a G3/G4 compatible facsimile machine and establish a facsimile session with the destination facsimile machine. If the communications services/systems are associated with a Web page, the end user's browser is directly linked to the appropriate URL.

The functionality of Communications Gateway Server can be extended to support other types of audio or text content, such as stock market information, weather, news, traffic reports, and the like, or video contents. The Communications Gateway Server may also allow cut and paste features, where the content downloaded from one communications service/system may be copied to another communications service/system. The Communications Gateway Server can also allow users to interact with different communications and messaging services/systems in a common messaging interface standard (VMUIF), such as 1 for review, 2 for save, 3 for erase. The Communications Gateway Server can translate the common input into the specific touch tone input required by the individual communications and messaging services/systems corresponding to the function desired by the user.

The Notification Gateway Server accepts the incoming notification events from various communications services/systems and formulates an out-going notification (alert) to a access-notification device. The access-notification device can be a pager, mobile phone, or e-mail address. The Notification Gateway Server emulates a access-notification device, such as the pager, mobile phone, or e-mail address, for processing incoming notification requests. The notification requests may be received from any communications services/systems for the multiple users who have subscribed to the PCP. The Notification Gateway Service will sort the incoming requests and attribute each request to the appropriate user's personal database.

If the notification request is of type pager, then the Notification Gateway Server will emulate a paging company and receive the paging signals over the telephone, paging, or IP network. The paging signals may include the pager-id that identifies the user for which the notification request is being received and the call back number that identifies the communications services/systems. This information along with the date and time of the notifications received will be stored in the appropriate user's personal

database. The detailed descriptions of the paging company and paging protocols are beyond the scope of this invention.

If the notification request is of type e-mail, then the Notification Gateway Server will receive the notification message over the IP network. The e-mail message includes the notification e-mail address of the user for whom the notification request is being received, and the call back number that identifies the communications services/systems. This information along with the date and time of the notification received will be stored in the appropriate user's personal database. The detailed descriptions of the e-mail protocols are beyond the scope of this invention.

In addition to pager and e-mail notification requests, the Notification Gateway Server is capable of receiving notification requests in any custom formats over the IP network.

At regular intervals, the Notification Gateway Server will process the requests stored in an individual user's account from their personal database, check the user's outgoing notification schedule, and send the outgoing notification to the user's preferred access-notification device according to the notification schedule.

If the outgoing notification is of type numeric pager, then the Notification Gateway Server will send the notification message to a user's pager device using the paging-call setup script stored in the user's personal database. The paging-call setup script may include out-dialing the paging company number, and/or out-pulsing the numeric paging message over the telephone network. The detailed descriptions of the paging protocols are beyond the scope of this invention.

If the outgoing notification is of type alphanumeric pager, then the Notification Gateway Server will send the notification message to a user's pager device using the paging-call setup script stored in the user's personal database. The paging-call setup script may include connecting to the paging company's notification server over the IP network, and transmitting the alphanumeric paging message specific to the user's paging account with the paging company. The detailed descriptions of the paging protocols are beyond the scope of this invention.

If the outgoing notification is of type e-mail, then the Notification Gateway Server will formulate an e-mail header with the detailed notification message and send it to a

user's e-mail address as provided in the user's personal database. The detailed descriptions of the e-mail protocols are beyond the scope of this invention.

If the outgoing notification is of type short message, then the Notification Gateway Server will formulate a short message consisting of the source of the notification, the date, the time, and the like, and send it to a user's mobile device using the SMS-call setup script stored in the user's personal database. The detailed descriptions of the paging protocols are beyond the scope of this invention.

There are certain embodiments of the system that are not claimed specifically in this invention such as: storing a Personal Address Book on the Personal Communications Database; storing a calendar of personal schedules and appointments on the Personal Communications Database; performing automated billing on credit cards; specific designs of Web pages including HTML coding, CGI scripts, and the like; allowing access to communication services/systems supporting Web pages, from the Internet User Interface; advertisement revenue models in order to support the continuation of the PCP service; PSTN telephony interfaces and components supported over standard computer operating systems; setting up and terminating PSTN telephone calls, and transmission of DTMF tones over the PSTN network; IP telephony interfaces and components supported over standard computer networks; setting up and terminating IP telephony calls; workings of a H.323 client for performing IP telephony activities such as voice signaling, DTMF transmission, and the like; Interactive Voice Response techniques used to support the Telephony User Interface; Voice Activated Dialing techniques used to connect to telephone networks through voice commands; Voice Recognition (VR) techniques used to navigate the Telephony User Interface; and other embodiments directly or indirectly associated with the system that are not part of the claims.

Although an illustrative embodiment of the invention has been disclosed, it will be apparent to those skilled in the art that various changes and modifications can be made which will achieve some of the advantages of the invention without departing from the spirit and scope of the invention. It will be obvious to those reasonably skilled in the art that other devices, systems, protocols and/or steps performing the same functions may be suitably substituted. In particular, it is noted that committees for IP communications

are developing standards that may expand the options available for delivering voice and data over IP networks, including wireless networks. It will be understood that the systems described herein can be modified to operate under different standards and protocols and can incorporate new techniques for collecting and delivering messages, as well as new technologies for storing data, including technologies for storing multimedia data, such as video and audio data. Moreover, it will be understood that although the systems have been described with reference to functional elements, the systems described herein can be computer programs that are generated from the numerous programming languages (e.g., the C language or the Java language), and that the blocks described herein are merely representative of the procedures and functions that can be performed by the programs. It will further be understood that the systems can be dedicated hardware devices, or combinations of hardware and software. Accordingly, it will be understood that the invention is not to be limited to the embodiments disclosed herein, but is to be understood from the following claims, which are to be interpreted as broadly as allowed under the law.

What is claimed is:

Claims

1. A unified messaging system comprising:
 a single access point (SAP) being configured to interact with a plurality of communications services/systems, mediums, and protocols; and
 an access mechanism being configured to allow a user to access the SAP with an access-notification device.
2. The unified messaging system of claim1 wherein the access mechanism comprises a user-interface.
3. The unified messaging system of claim1 wherein the access-notification device comprises a telephone.
4. The unified messaging system of claim1 wherein the access-notification device comprises a wireless device.
5. The unified messaging system of claim1 wherein the access-notification device comprises an Internet Access Device.
6. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises voice mail.
7. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises e-mail.
8. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises a facsimile machine.
9. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises an answering machine.
10. The unified messaging system of claim1 wherein the plurality of communications

services/systems, mediums, and protocols comprises a pager.

11. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises an information service provider.
12. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises a Web site.
13. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises a computer network.
14. The unified messaging system of claim1 wherein the plurality of communications services/systems, mediums, and protocols comprises a wireless network.
15. The unified messaging system of claim1 wherein the SAP comprises a Database Server being configured to store information associated with the plurality of communications services/systems, mediums, and protocols.
16. The unified messaging system of claim15 wherein the information further comprises a personal communication services/systems profile for a particular user.
17. The unified messaging system of claim16 wherein the information further comprises at least one user-id and at least one password, the at least one user-id and the at least one password being associated with at least one of the plurality of communications services/systems, mediums, and protocols.
18. The unified messaging system of claim1 wherein the SAP comprises an Administration Module being configured to perform maintenance processes for the Database Server.

19. The unified messaging system of claim1 wherein the SAP comprises an Administration Module being configured to perform registration and service administration.
20. The unified messaging system of claim1 wherein the SAP comprises a Communications Gateway Server being configured to interface with the access-notification device.
21. The unified messaging system of claim1 wherein the access mechanism comprises a unified-user-id and a unified-password.
22. The unified messaging system of claim21 wherein the unified-user-id and the unified-password are unique to a particular user.
23. The unified messaging system of claim1 wherein the SAP comprises a Notification Gateway Server (NGS) being configured to monitor and receive incoming notification events from the plurality of communications services/systems, mediums, and protocols.
24. The unified messaging system of claim 23 wherein the NGS is further configured to manage the incoming notification events.
25. The unified messaging system of claim23 wherein the NGS is further configured to process the incoming notification events.
26. The unified messaging system of claim23 wherein the NGS is further configured to transmit outgoing notification alerts to the access-notification device.
27. The unified messaging system of claim26 wherein the outgoing notification alerts are transmitted to the access-notification device according to a predetermined criteria.

28. The unified messaging system of claim1 wherein the SAP is a Web portal.
29. A unified messaging system, comprising:
- a database server with multiple communications databases for storing a plurality of user profiles (UPs) and a plurality of communications profiles (CPs), each of the UPs being associated with one or more of the CPs, each of the CPs being associated with a communications service (CS).
30. The unified messaging system of claim29 further comprising an interface for enabling a user to define and maintain at least one of the UPs and at least one of the CPs.
31. The unified messaging system of claim29 wherein each UP comprises a unified-user-id, a unified-password, at least one user-id, at least one password, and billing information, the at least one user-id and the at least one password being associated with at least one of the CPs.

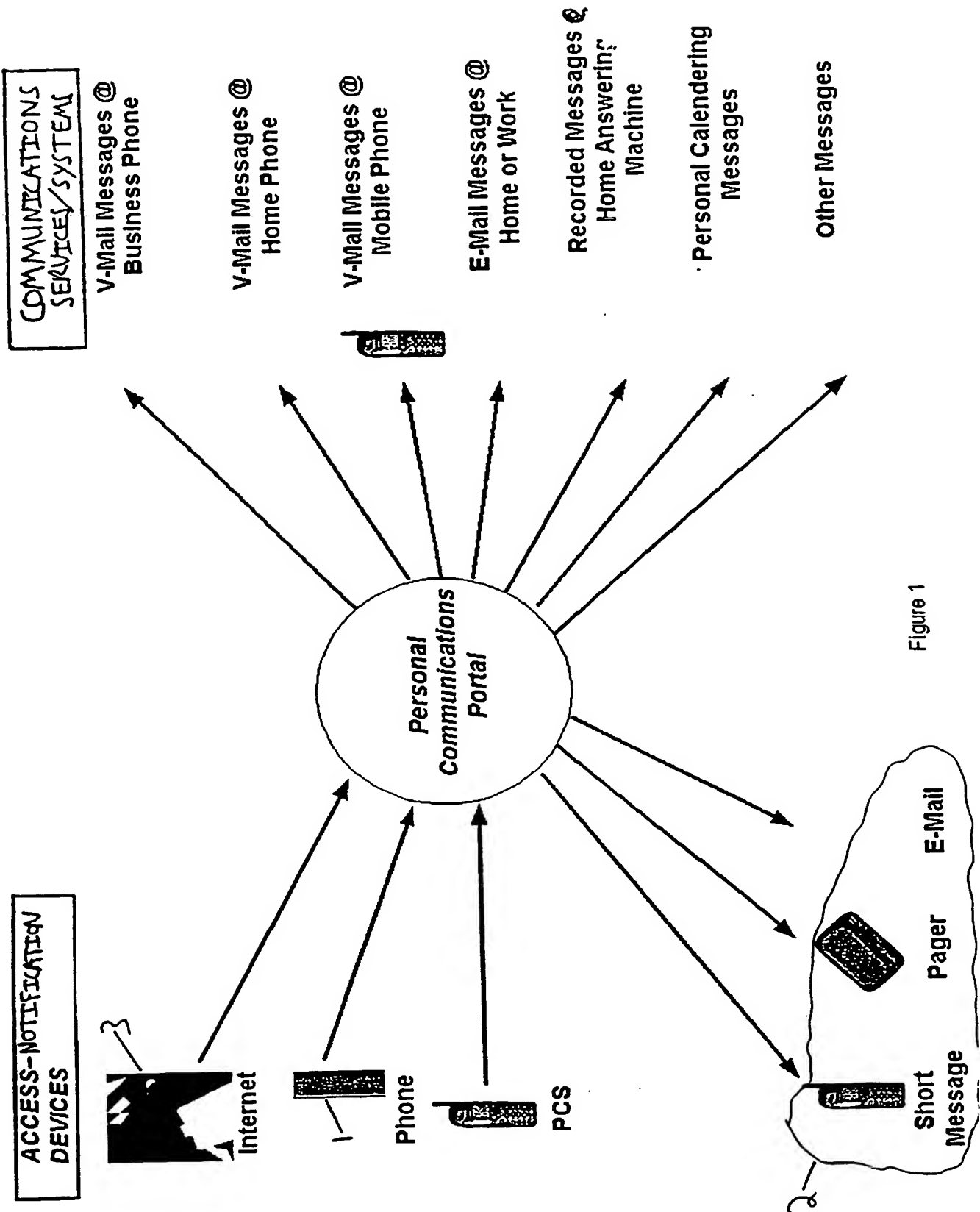


Figure 1

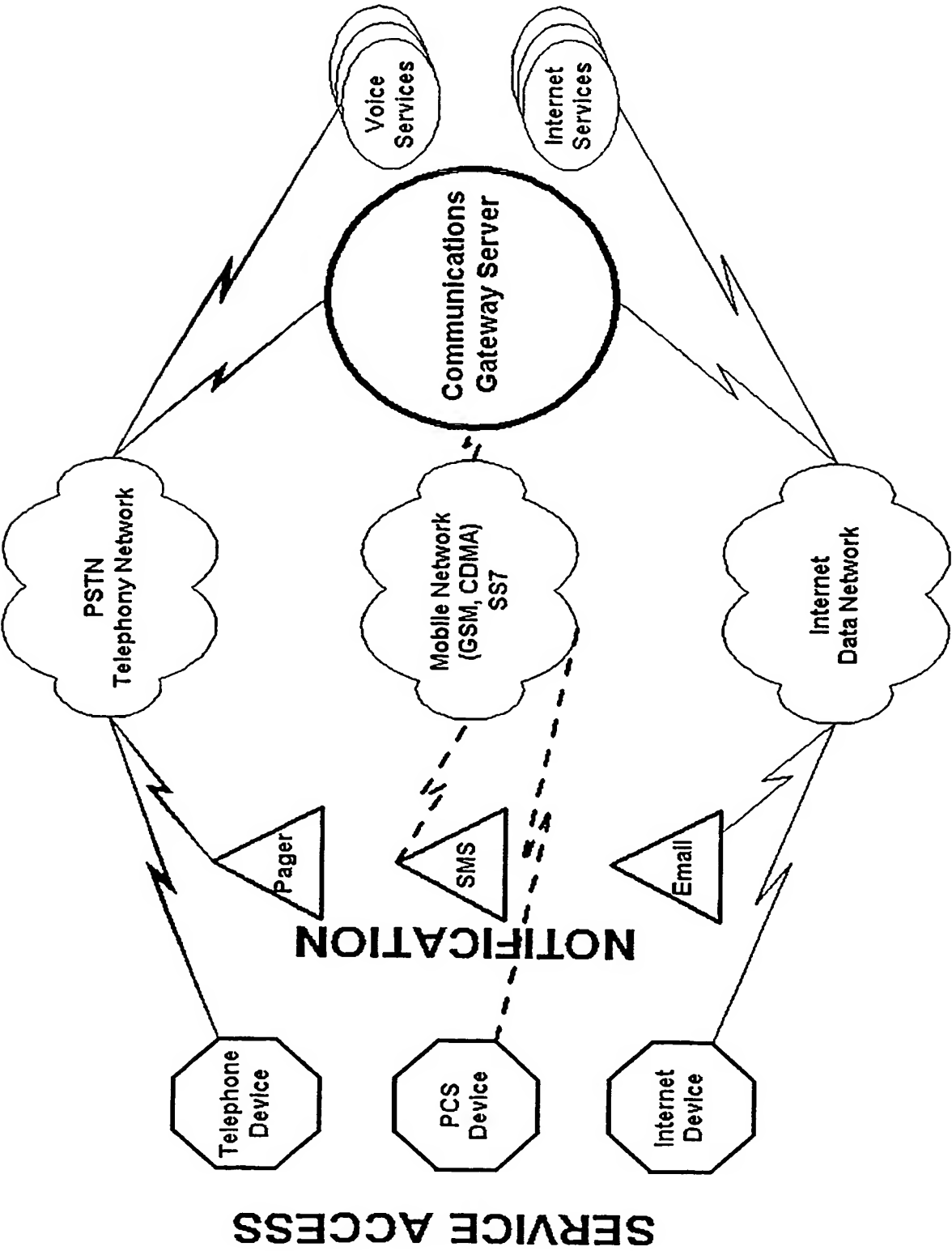


Figure 2

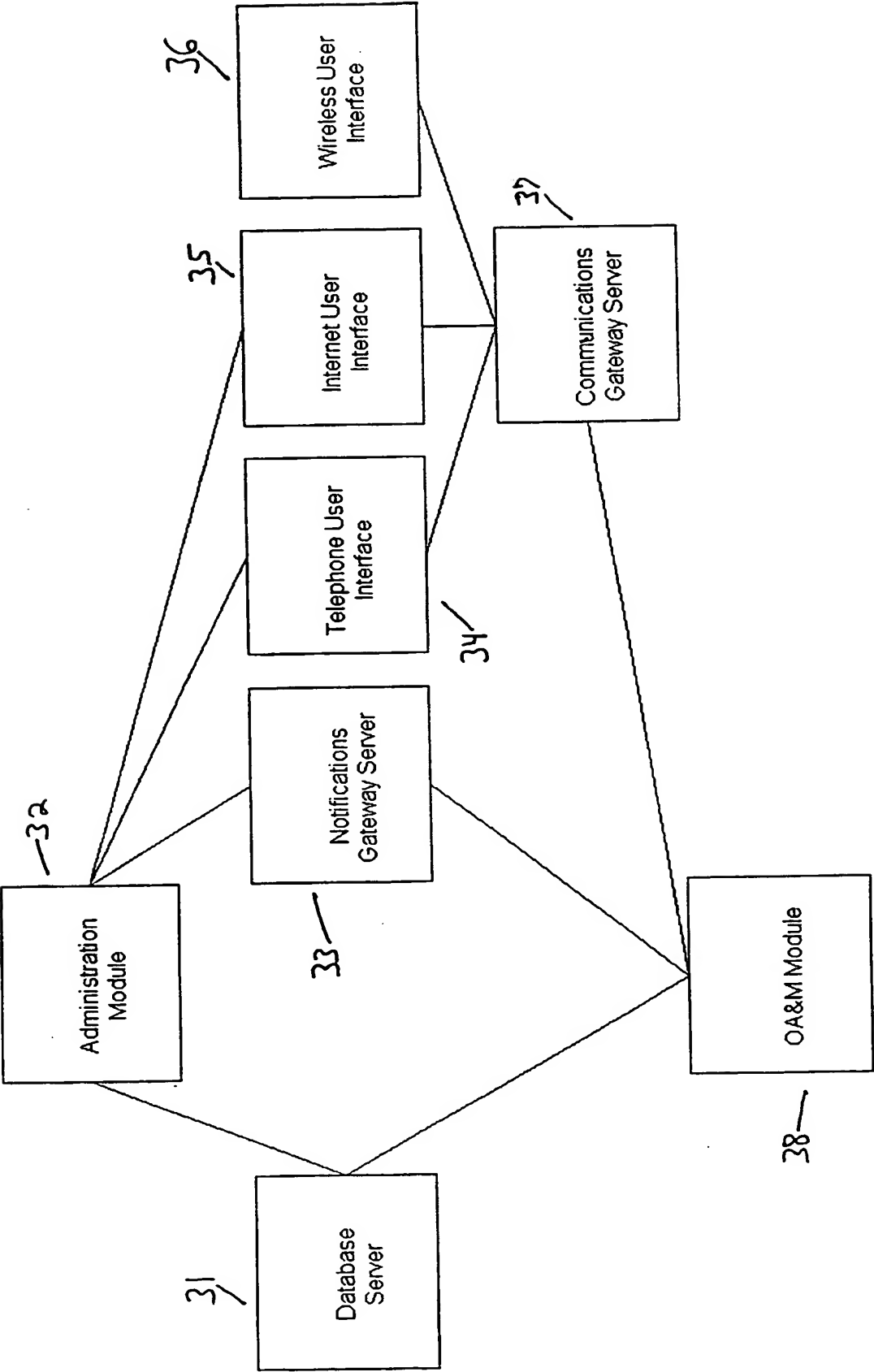


Figure 3

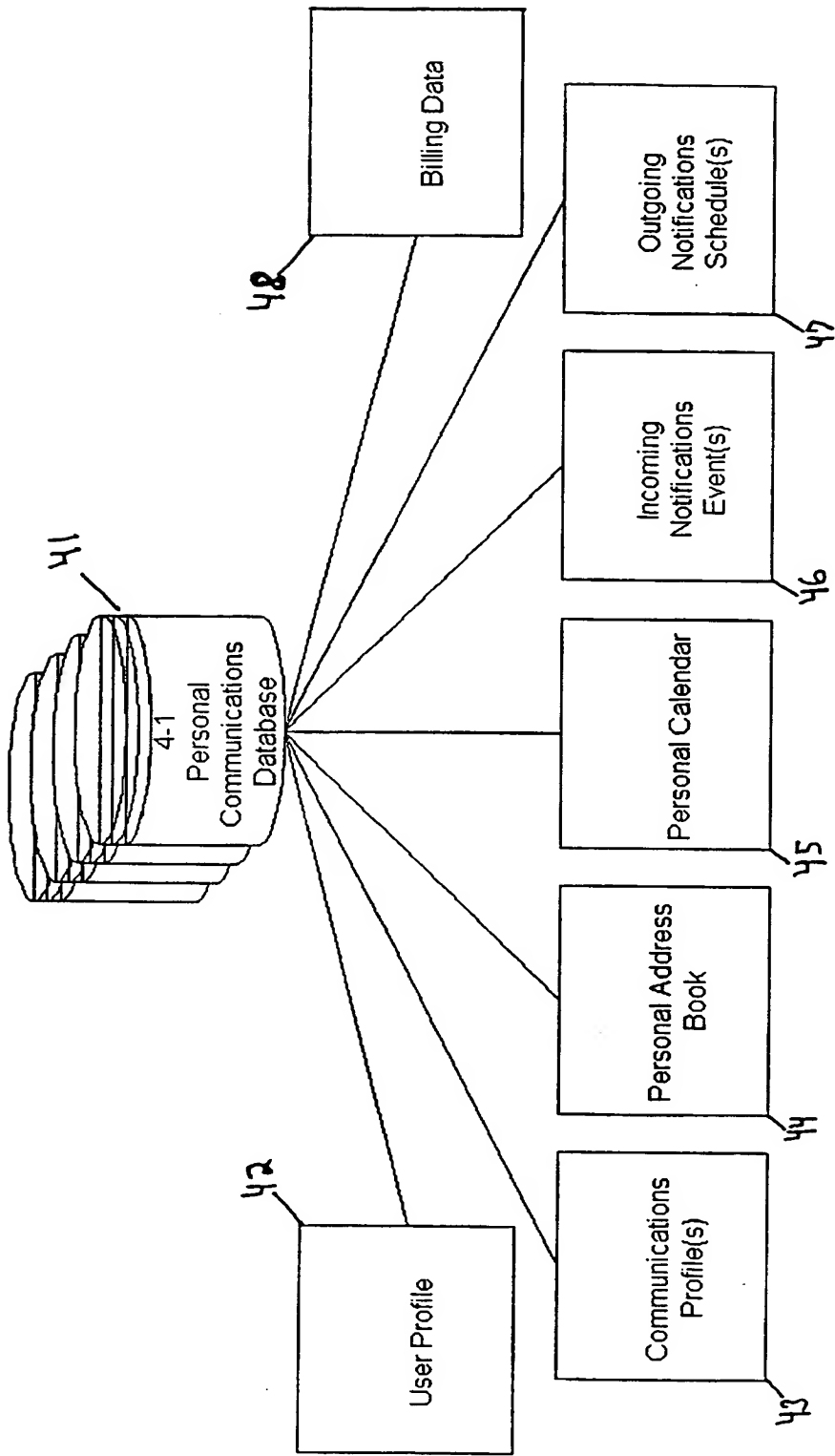


Figure 4

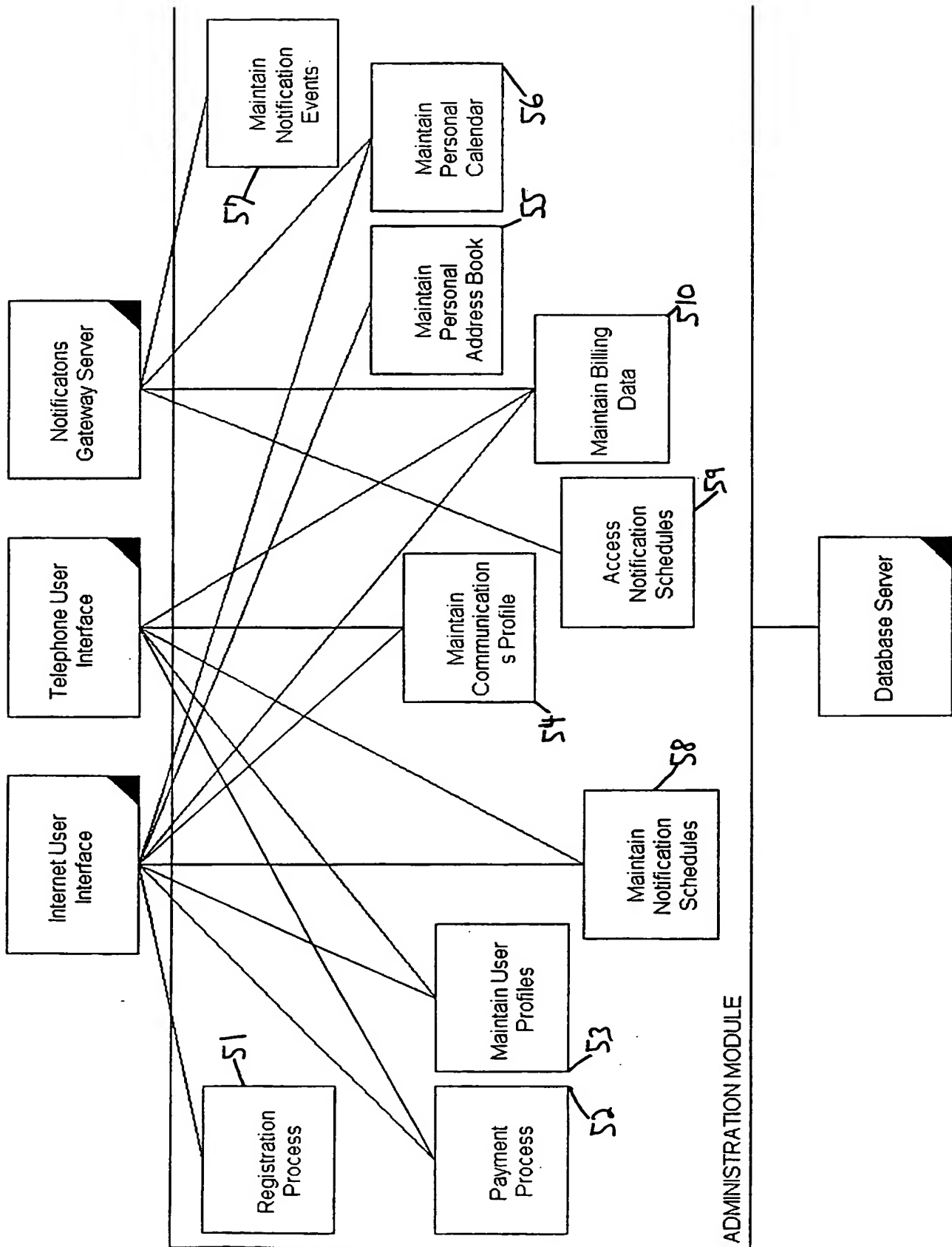


Figure 5

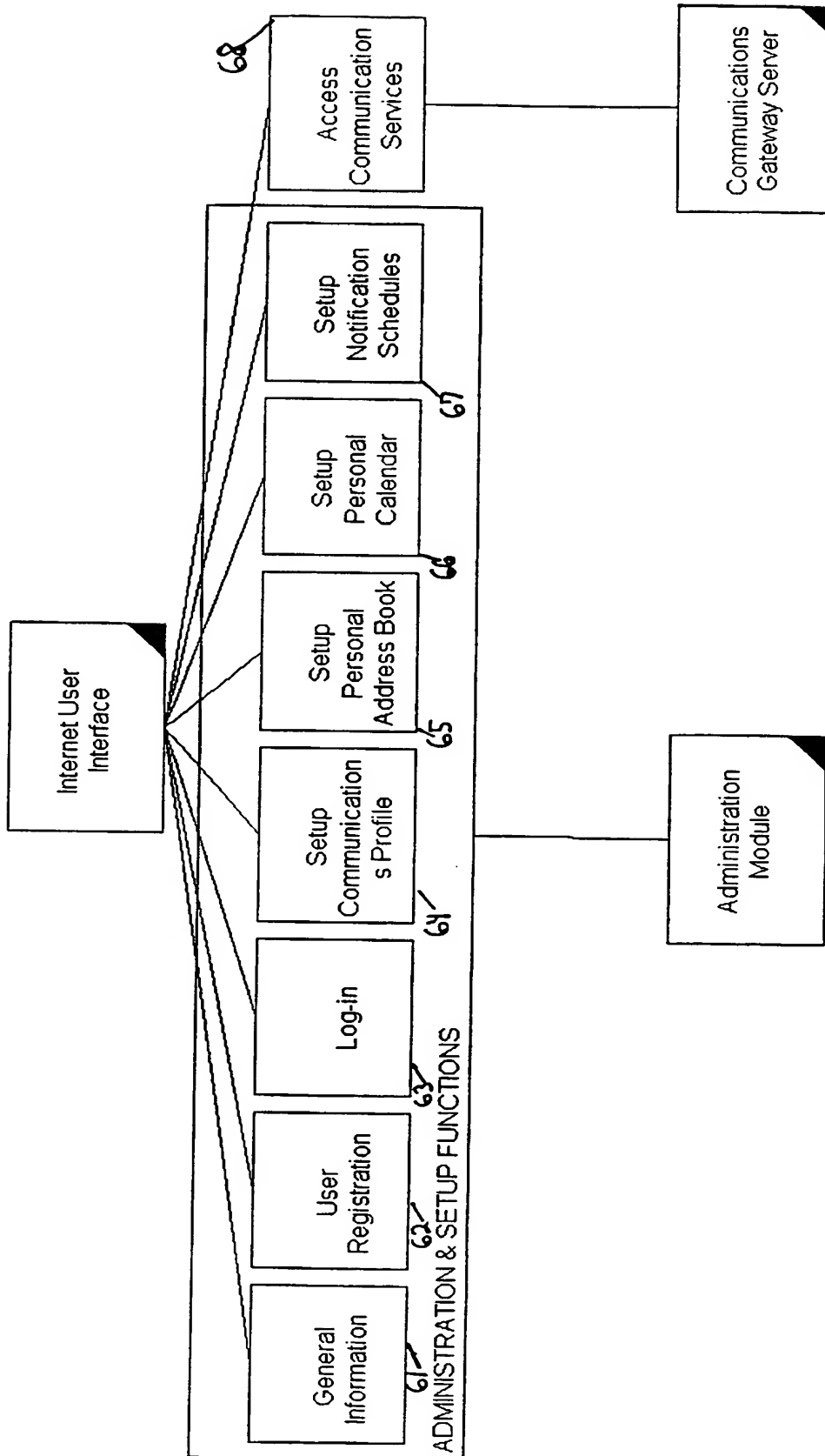


Figure 6

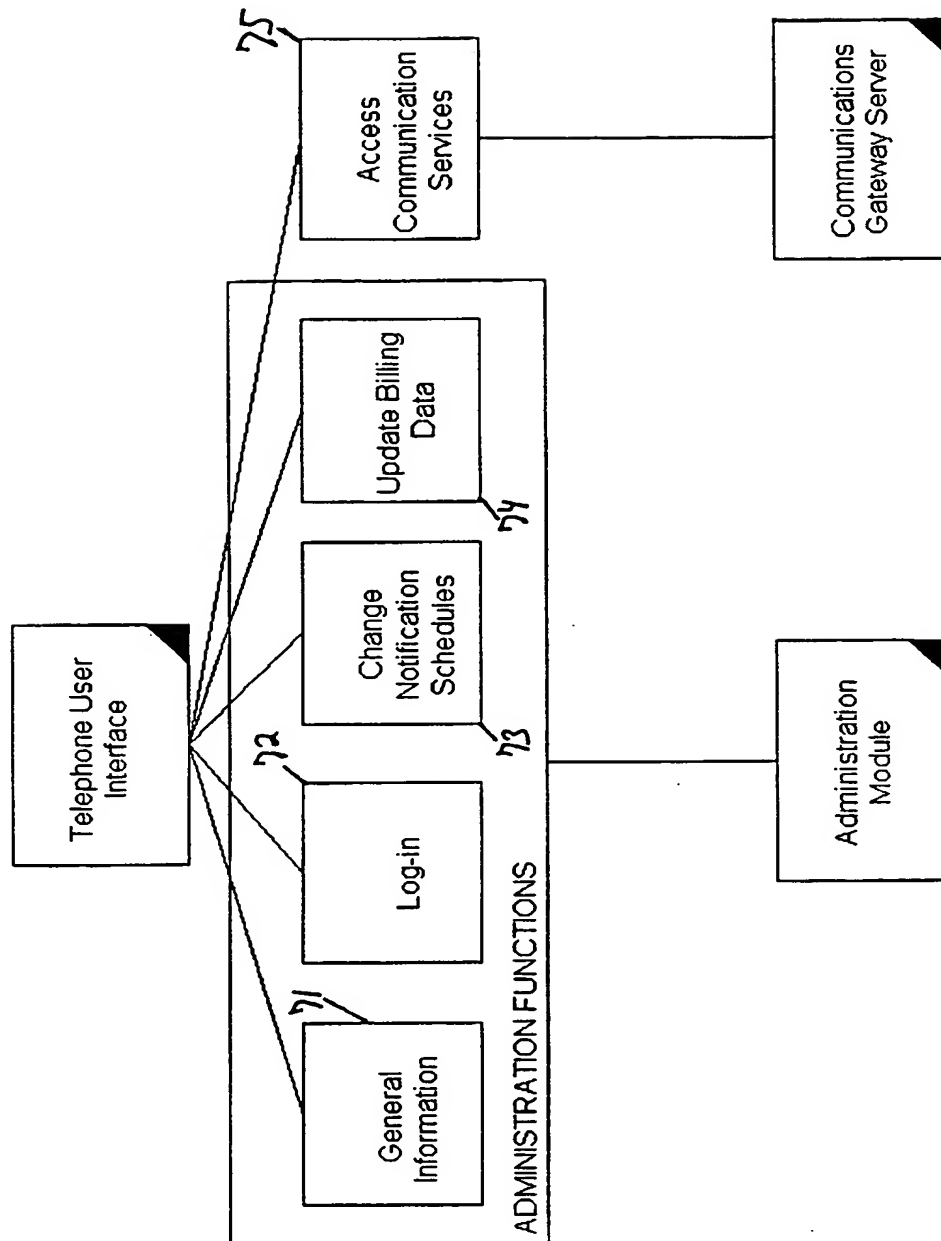


Figure 7

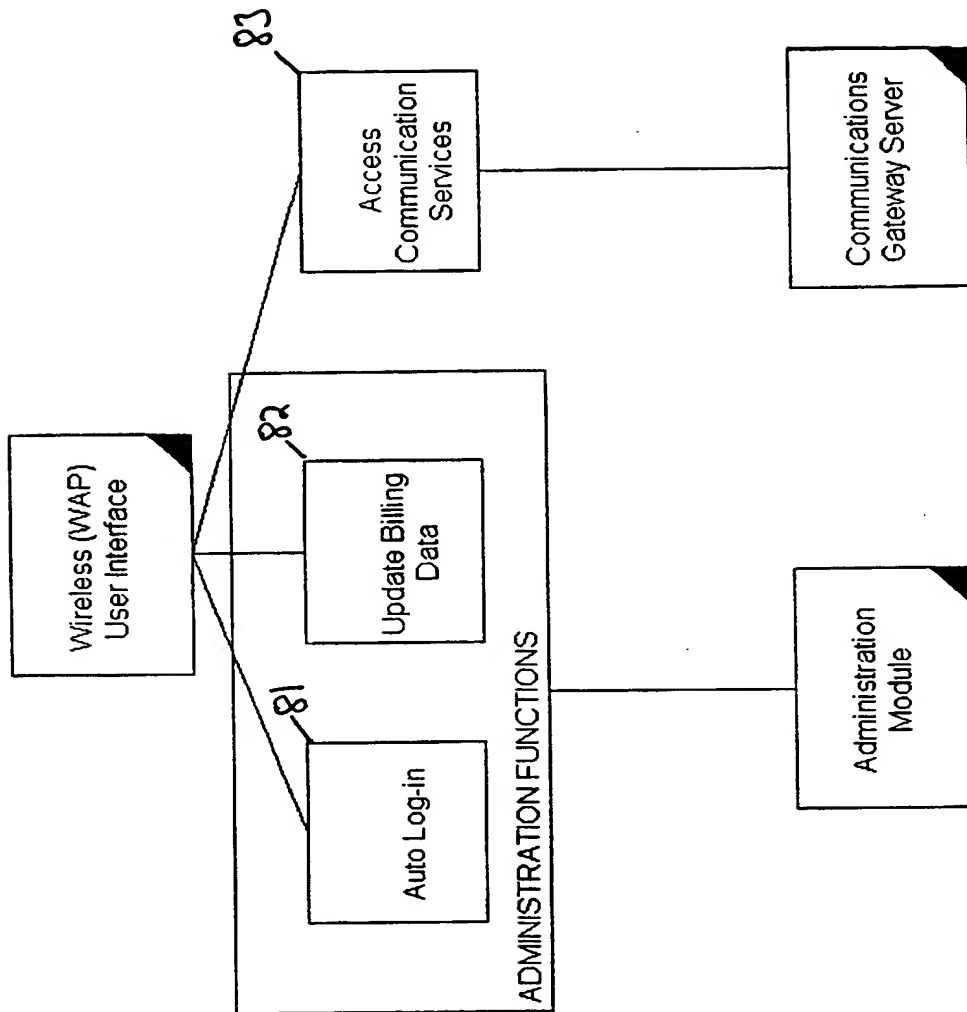


Figure 8

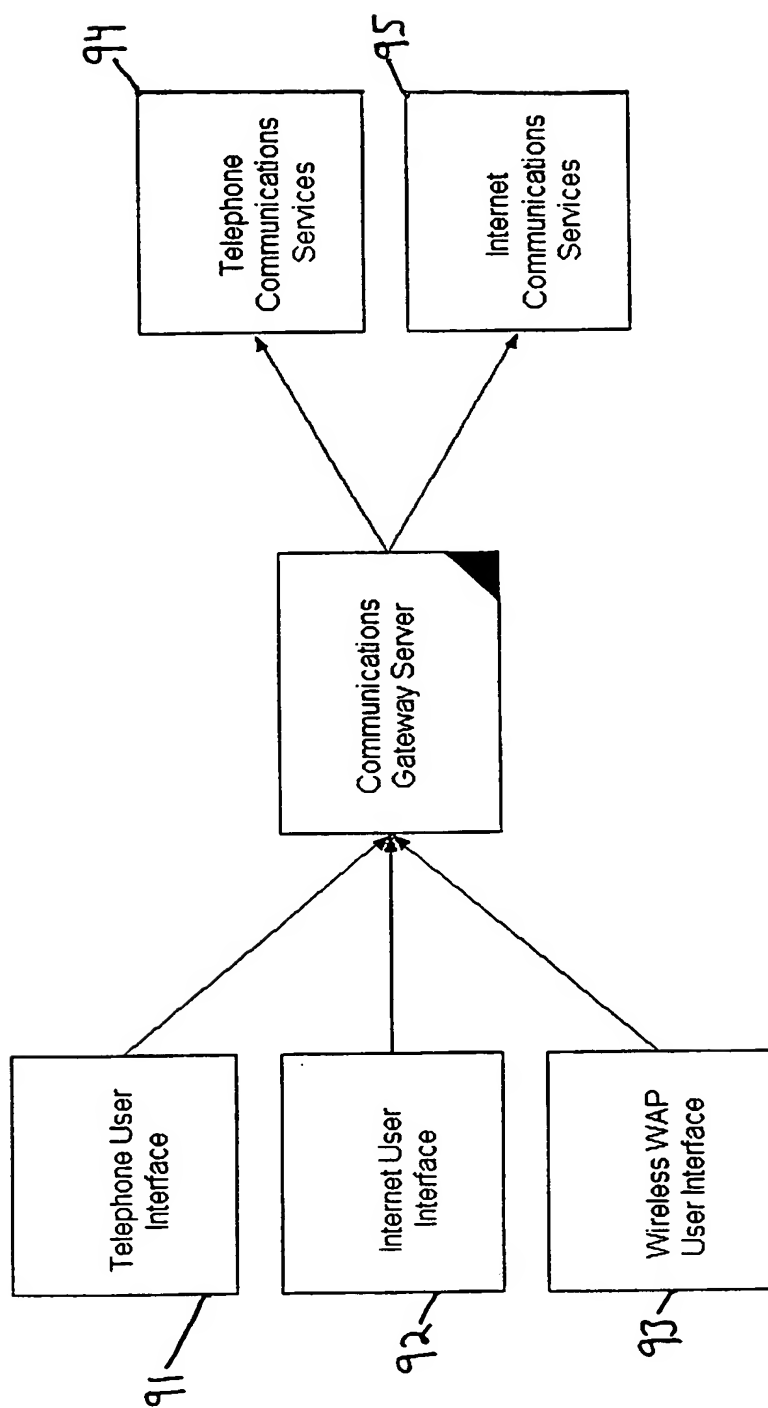


Figure 9

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/12021

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L12/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 742 905 A (BROCKMAN JAMES JOSEPH ET AL) 21 April 1998 (1998-04-21) abstract column 5, line 54 -column 7, line 16 column 10, line 34 - line 54 figures 1-4	1-31
X	US 5 870 549 A (BOBO II CHARLES R) 9 February 1999 (1999-02-09) abstract column 4, line 36 -column 6, line 22 column 7, line 15 -column 9, line 25 column 15, line 41 -column 16, line 18 column 18, line 18 - line 24	1-31
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

12 October 2000

Date of mailing of the international search report

20/10/2000

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/12021

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>MILLER J G ET AL: "ACCESSING MESSAGES YOUR WAY" AT & T TECHNOLOGY, US, AMERICAN TELEPHONE & TELEGRAPH CO. SHORT HILLS, NEW JERSEY, vol. 10, no. 1, 21 March 1995 (1995-03-21), pages 6-9, XP000530274 ISSN: 0889-8979 the whole document -----</p>	1-31

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/12021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5742905 A	21-04-1998	CA 2199802 A EP 0782805 A JP 9511884 T WO 9609714 A US 5742668 A	28-03-1996 09-07-1997 25-11-1997 28-03-1996 21-04-1998
US 5870549 A	09-02-1999	US 5675507 A AU 9679398 A EP 1034651 A WO 9918716 A CA 2232397 A EP 0870238 A WO 9634341 A	07-10-1997 27-04-1999 13-09-2000 15-04-1999 31-10-1996 14-10-1998 31-10-1996